

AMENDMENTS TO THE CLAIMS

The following listing of claims should be entered to replace all prior listings of the claims in this application. In accordance with Rule 121, the status of each claim is indicated parenthetically. As can be seen in this listing, claims 45-51 and 136-137 have been amended. Applicant also adds new claims 138-145 to this application. Claims 45-51 and 136-145 remain in the application. Each amendment is believed to have been made in accordance with Rule 121, however, should any unintended informality exist, it is requested that the undersigned be contacted by telephone so that it may be resolved as expeditiously as possible.

1-44 (Cancelled)

45 (Currently Amended)

~~A method of sorting equine sperm cells according to a determination of their sex characteristics~~
establishing an equine artificial insemination sample for equine artificial insemination comprising the steps of:

- a. obtaining equine sperm cells from a male of a species of equine mammal;
- b. staining said equine sperm cells to allow differentiation based upon a sex characteristic;
- c. establishing a cell source which introduces said equine sperm cells which have been stained into a sheath fluid;
- d. forming droplets in said sheath fluid;
- e. entraining said equine sperm cells which have been stained in said droplets;
- f. differentiating between said equine sperm cells entrained in said droplets based upon said sex characteristic;
- g. separating said droplets based upon said sex characteristic of said equine sperm cells entrained;
- h. establishing a skim milk solution into which said droplets separated based upon said sex characteristic of said equine sperm cells entrained are collected/collected;

- i. collecting viable equine sperm cells separated based upon said sex characteristic in said skim milk solution;
- [[ii]]i. establishing a ~~equine~~ equine artificial insemination sample containing at least some of said viable equine sperm cells separated based upon said sex characteristic which are capable of fertilizing at least one egg within a female of said species of equine mammal.

46

(Currently Amended)

A method of ~~sorting equine sperm cells according to a determination of their sex characteristic~~ establishing an equine artificial insemination sample for equine artificial insemination as described in claim 45 wherein said step of establishing a skim milk solution into which said equine sperm cells are collected comprises the step of establishing a solution containing a skim milk extender as a collection fluid.

47

(Currently Amended)

A method of ~~sorting equine sperm cells according to a determination of their sex characteristic~~ establishing an equine artificial insemination sample for equine artificial insemination as described in claim 46 wherein said step of establishing a skim milk solution into which said equine sperm cells are collected further comprises the step of establishing a solution containing about four percent egg yolk as a collection fluid.

48

(Currently Amended)

A method of ~~sorting equine sperm cells according to a determination of their sex characteristic~~ establishing an equine artificial insemination sample for equine artificial insemination as described in claim 45 wherein said sheath fluid contains a HEPES buffered medium.

49

(Currently Amended)

A method of ~~sorting equine sperm cells according to a determination of their sex~~
~~characteristic establishing an equine artificial insemination sample for equine~~
artificial insemination as described in claim 45 wherein said step of separating
said droplets based upon said sex characteristic of said individual equine sperm
cells comprises the step of sorting said droplets having said equine sperm cells
entrained using a flow cytometer.

50 (Currently Amended)

A method of ~~sorting equine sperm cells according to a determination of their sex~~
~~characteristic establishing an equine artificial insemination sample for equine~~
artificial insemination as described in claim 49 wherein said step of sorting said
droplets having said equine sperm cells entrained using a flow cytometer
comprises the step of sorting said droplets having said equine sperm cells
entrained at a rate of at least nine hundred viable equine sperm cells per second.

51 (Currently Amended)

A method of ~~sorting equine sperm cells according to a determination of their sex~~
~~characteristic establishing an equine artificial insemination sample for equine~~
artificial insemination as described in claim 49 wherein said step of sorting said
droplets having said equine sperm cells entrained comprises the step of operating
said flow cytometer at a pressure of at least about fifty pounds per square inch.

52-135 (Cancelled)

136 (Currently Amended)

A method of ~~sorting equine sperm cells according to a determination of their sex~~
~~characteristic establishing an equine artificial insemination sample for equine~~
artificial insemination as described in claim 45 wherein said equine artificial
insemination sample is selected from the group consisting of: an equine artificial
insemination sample of no more than about five million equine sperm cells, and

an equine artificial insemination sample of no more than about twenty-five million equine sperm cells.

137

(Currently Amended)

~~A method of sorting equine sperm cells according to a determination of their sex characteristic establishing an equine artificial insemination sample for equine artificial insemination~~ as described in claim 45 wherein said equine artificial insemination sample has a volume selected from the group consisting of: 0.2 ml, and 1 ml.

138

(New)

A method of establishing an equine artificial insemination sample for equine artificial insemination comprising the steps of:

- a. obtaining equine sperm cells from a male of a species of equine mammal;
- b. staining said equine sperm cells to allow differentiation based upon a sex characteristic;
- c. establishing a cell source which introduces said equine sperm cells which have been stained into a sheath fluid;
- d. forming droplets in said sheath fluid;
- e. entraining said equine sperm cells which have been stained in said droplets;
- f. differentiating between said equine sperm cells entrained in said droplets based upon said sex characteristic;
- g. separating said droplets based upon said sex characteristic of said equine sperm cells entrained at a rate of at least nine hundred viable equine sperm cells per second;
- h. establishing a skim milk solution into which said droplets separated based upon said sex characteristic of said equine sperm cells entrained are collected;
- i. collecting viable equine sperm cells separated based upon said sex characteristic in said skim milk solution;

- j. establishing an equine artificial insemination sample containing at least some of said viable equine sperm cells separated based upon said sex characteristic which are capable of fertilizing at least one egg within a female of said species of equine mammal.

139

(New)

A method of establishing an equine artificial insemination sample for equine artificial insemination as described in claim 138 wherein said step of establishing a skim milk solution into which said equine sperm cells are collected comprises the step of establishing a solution containing a skim milk extender as a collection fluid.

140

(New)

A method of establishing an equine artificial insemination sample for equine artificial insemination as described in claim 139 wherein said step of establishing a skim milk solution into which said equine sperm cells are collected further comprises the step of establishing a solution containing about four percent egg yolk as a collection fluid.

141

(New)

A method of establishing an equine artificial insemination sample for equine artificial insemination as described in claim 138 wherein said sheath fluid contains a HEPES buffered medium.

142

(New)

A method of establishing an equine artificial insemination sample for equine artificial insemination as described in claim 138 wherein said step of separating said droplets based upon said sex characteristic of said equine sperm cells further comprises the step of sorting said droplets having said equine sperm cells entrained using a flow cytometer.

143

(New)

A method of establishing an equine artificial insemination sample for equine artificial insemination as described in claim 142 wherein said step of sorting said droplets having said equine sperm cells entrained comprises the step of operating said flow cytometer at a pressure of at least about fifty pounds per square inch.

144

(New)

A method of establishing an equine artificial insemination sample for equine artificial insemination as described in claim 138 wherein said equine artificial insemination sample is selected from the group consisting of: an equine artificial insemination sample of no more than about five million equine sperm cells, and an equine artificial insemination sample of no more than about twenty-five million equine sperm cells.

145

(New)

A method of establishing an equine artificial insemination sample for equine artificial insemination as described in claim 138 wherein said equine artificial insemination sample has a volume selected from the group consisting of: 0.2 ml, and 1ml.